

## ABSTRACT

Light irradiation detecting sections for irradiating laser light to reflectors of a rotational body and receiving the reflected light are downsized. A light transmitting and receiving device 21 has incident light receiving fibers 25a and 25b for guiding both incident light and reflected light and light irradiation detecting sections 11a and 11b, as well as polarization-maintaining fiber circulators 24a and 24b. The light transmitting and receiving device is structured such that reflected light is received through the same light path as the light path for outputting laser light from a laser light output device 20 through a branch connector 23. The polarization-maintaining fiber circulators 24a and 24b polarize and output the polarized laser light, as well as input reflected light through the same light path as the light path, through which the laser light is output, separate the reflected light from laser light from the laser light output device 20, and output the reflected light to a signal processing device 22 for obtaining torque.